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ABSTRACT

This paper focuses on the mechanics and dynamics of questioning techniques as aids to trainers/teachers in "getting across" subject matter and interacting effectively with learners. The mechanics include three levels of questions--knowledge, application and problem-solving. Each of these levels is designed to foster different and progressively higher levels of learner thinking, and five types of probing questions--extension, clarification, justification, prompting and redirecting--are used to help guide responses that are forthcoming to the planned questions. The dynamics of questioning, i.e., the verbal and nonverbal behaviors that accompany trainer's attempts to use different levels of probes, include: phrasing a concise question; delivering that question appropriately; using wait-time; listening to the learner's response; and dealing with that response appropriately. Each of these techniques and strategies is discussed and examples are provided where appropriate. (DJR)

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DO WHAT??? (Using Specific Questioning Techniques To Get Specific Results in Training)

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INTRODUCTION

It has been said that before learning can occur, one must have something to learn, someone to learn it, and some way to teach it. In a training context, the first two variables are givens; the third item rests on many variables and yet determines, in essence, whether or not learning does occur. If "some way to teach it" is examined only in light of broad categories such as lecture vs. demonstration, slides, realia, chalkboards, computers, SIPs and the like, a large measure of what really accounts for learning is lost. The critical element is the ability of the trainer to "get it across" not only by knowing the subject matter but by interacting effectively with the learners who have assembled. This is virtually impossible for any trainer to accomplish without utilizing effective questioning techniques and strategies.

In the first few minutes of a training/teaching session, questioning can serve nicely to arouse learner interest in the content to follow; to motivate the learner to participate; to gain learner attention; to present problems to be solved; and to determine prerequisite learner knowledge, experiences or attitudes. In the body of the session itself, questioning can be used to further stimulate learner thinking; to develop key points; to revive lagging interest; to bring non-participants into a discussion; to summarize before moving on to other points; and to focus attention. In the closure of a session, questioning can be used as a tool to check for learner understanding and to locate areas where remediation might be necessary. In learner practice situations, questioning can provide invaluable information

about where learners are having difficulty; about how well learners "understand" and whether or not they can apply the information that was just presented.

In order to assist trainers/teachers in their attempts to utilize questioning in order to achieve the purposes just mentioned, this paper will focus on both the mechanics and dynamics of questioning. The mechanics of questioning involves the categorization of questions according to the purpose for which they are used, and will include attention to both the three levels of questions and the five types of probing questions. The dynamics of questioning involves the communication skills that a trainer/teacher brings to bear when asking questions at a particular level or of a particular probing category. It is particularly useful to focus on both the mechanics and dynamics of questioning, as the perfection of neither aspect will ensure the success of a questioning strategy. Not only must a given question be derived for a specific purpose (level/probe), it must also be delivered in a manner that invites learner response -- even an inappropriate response-- without fear of reprisal.

The Mechanics of Questioning

Levels of Questioning

Different levels of questions are appropriate and necessary at different points in training/teaching. The "level" of a given question

is determined not by the actual wording of the question but by the level of thought a learner must employ in order to respond to the question. It is helpful to think of questions in terms of three levels.

1. Knowledge Level Questions. Questions at this level simply ask the learner to rely on memory to regurgitate back to the trainer/teacher specific information -- facts, dates, names, formulae, definitions, etc. Generally, these questions clearly have right or wrong responses (or at least appropropriate or inappropriate responses), with very little areas of grey for debate. If a learner can respond to this level of question, the only judgment that a trainer/teacher can make is that the learner who responded does in fact possess in his or her memory banks the bit or bits of information necessary to respond to that particular question. It cannot be determined whether in point of fact that learner would be able to do anything with the information that can be recalled -- or that the learner really even understands the answer s/he has given!

   Examples:

   What levels are included in Maslow's Heirarchy of Human Needs?

   How does Shimkin define human ecology?

What are the four basic food groups?

How is the presence of hydrogen sulfide gas detected in oil wells?

Knowledge level questions serve a distinctly useful function in training and teaching, for there are many occasions when it must be determined whether or not learners do possess basic information. It is very easy to make the mistake of assuming this is true when in fact only one or two learners in the room have grasped, for instance, Shimkin's definition of human ecology. If this definition is critical to an ensuing discussion or exercise and if only one or two learners "know" that definition, rest assured that the success of the discussion planned will be in jeopardy -- simply because the trainer/teacher assumed and did not ask a fairly low-level recall question.

Key words that often appear in knowledge level questions include the following.

Define	Describe
Identify	Indicate
List	Name
Paraphrase	Recognize
Review	Restate
Contrast	Compare
Differentiate	Summarize
State	Distinguish

The inherent danger of this particular level of questions for the teaching-learning situation, however, is that far too many trainers and teachers rely on this level almost exclusively without utilizing the other two levels described in the following paragraphs. To do so is to limit unnecessarily the amount of feedback that is obtainable about the depth to which learners truly understand and are able to use given information that has been presented. The truly good trainer/teacher is not satisfied with merely ascertaining that a given learner "owns" a specific bit of information. Application and problem-solving level questions provide the necessary additional layers of questioning that make it such a powerful tool.

2. Application Level Questions. At this level, questions are deliberately designed to determine whether or not a learner can use in specific situations the information s/he could remember in response to knowledge level questions. The application level is the second level in the questioning heirarchy (for in fact it is a heirarchy), with knowledge being the first of three levels. The learner cannot use what s/he does not know, so the importance of the knowledge level questions bears reemphasis. But the trainer/teacher is urged not to stop at the knowledge level; instead, learners should be plied with questions that ask them to apply what they say they know.

Examples:

We have discussed the differences in the definitions of fear and anxiety. From the description I have just given you, would you say this patient is "afraid" or "anxious?"

On the handout you will see a bar graph of the company's production rates. What does this graph tell you about production rates over a five-year period of the company's history?

Which of these three customer remarks would you not need to support with a benefit statement?

Again, application level questions require that the learner must first remember and understand the basic information involved and that s/he be able to transfer that information to a concrete example or situation. But by utilizing such questions, the trainer/teacher fosters learner ability to transfer knowledge and to remember what s/he has been taught since now that information must be put to use.

Key words that often appear in application level questions include the following.

Calculate	Draw
Estimate	Illustrate
Measure	Perform
Sketch	Demonstrate
Set up	Use
Employ	Give an example...
Locate	Record

Once again, though, the caution must be mentioned that the level of the question is determined by the level of thought required in articulating a response -- not by the wording of the question itself. For instance, consider the question "Which of these three customer remarks would you not need to support with a benefit statement?" If the response to that

question were on page 314 of the learner's training text, the "level" of that question would be knowledge, not application, since all the learner has to do in order to respond correctly is to recall the proper response from the text.

3. Problem-Solving Level Questions. Learners must be able to sort through bits of knowledge known and used in order to determine the relevance of that knowledge to new situations, recognize the characteristics of the new situation as it relates to previously-known situations, and then use -- with appropriate modification -- the most appropriate knowledge and method to bring to bear on the new situation or problem. The ability to go through this process of analysis and synthesis surpasses remembering and applying previously-learned information; it involves the intellectual ability to attack problems and make decisions by adapting what is known to entirely new situations. Learners must be provided with opportunities to examine situations and problems critically, and to make decisions from an array of alternative solutions or approaches. Problem-solving level questions provide the mechanism for stimulating learners to operate at this high cognitive level.

These questions are at the top of the questioning heirarchy; they are the "hard" questions, often those with no clear-cut right or wrong, appropriate or inappropriate response. They are avenues to discussion, debate and critical thinking.

Examples:

Is Maslow's heirarchy realistic, and do you think it holds any value to you as a supervisor?

Will acupuncture be taught in major medical schools in this country within the next 15 years?

How would you alter this design to account for the additional 50-feet span that was not factored into the original design of the bridge?

What recommendations do you propose to streamline our reporting procedure?

Benefits to the learner of such "hard" questions are many, including increased interest, increased retention of material learned, increased involvement, and increasingly higher levels of cognition. Essentially, such questions provide learners with glimpses into and challenges associated with situations and problems that they will not encounter as classical "textbook" problems.

Key words that often appear in problem-solving level questions include the following.

Compose	Assess
Criticize	Construct
Decide	Forumlate
Judge	Plan
Propose	Conclude
Debate	Defend
Design	Recommend
Challenge	Advocate
Suggest	Rank
Derive	Choose

It is vital that the trainer or teacher invest time and energy in formulating a questioning strategy prior to taking the floor to engage learners in a session that involves questioning. To assume that insightful and meaningful questions will naturally spring forth as a result of the content and/or discussion is to make a serious error in judgment; those questions that do spring forth on the spur of the moment in training and teaching are generally lower level (recall) questions that do little to challenge, interest, vitalize or catapult learners to higher levels of cognition. A deliberate effort should be made by the concerned trainer/teacher to determine at what points in the lesson questions need to be asked -- and for what purposes.

But unfortunately, even the most meticulous plan can fall prey to unforeseen circumstances once The Plan meets The Learner. "Nothing works all the time," so the trainer/teacher is urged to consider the use of probing questions as a valuable and necessary adjunct to the planning and utilization of knowledge, application and problem-solving level questions.

Probing Questions

Probing questions cannot be planned in advance; they are based solely upon responses that are forthcoming from learners when the planned questions are asked at the different levels just described. All trainers/teachers know the range of alternatives possible when questions are asked to a group of learners: correct responses (generally the most preferable alternative); totally incorrect or inappropriate responses; partially correct or appropriate responses; totally disorganized but probably appropriate responses once they have been interpreted; no response at all; and finally, the totally "off the wall" and completely unanticipated response out of left field (the kind that leaves one seriously considering a career change). Probing questions offer means of determining why learners cannot respond appropriately or completely, of guiding learners to the desired responses -- in lieu of the more common response of trainers/teachers, which is to answer the question for the learners, move on, or give a quiz on the spot.

There are essentially five (5) types of probing questions that can be utilized with learners who respond with incorrect, partially correct or disorganized responses, or with no response. Each is linked to a different function.

1. Extension Probes. These probing questions ask the learner to add to (extend) a response s/he has given to another question. By asking an extension probe, the trainer/teacher is in no way indicating to the learner that his or her response is incorrect or inappropriate; the learner is simply being asked to add more detail, give an example, expand, etc. The forthcoming response can help the trainer/teacher gauge more accurately the extent of the learner's grasp of the topic in question. A common extension probe is one that asks the learner to "give an example of...."

2. Clarification Probes. Clarification probes differ from extension probes in that they are based on a learner response that is unclear, incomplete, not well thought out, or is one that the trainer/teacher feels might be misleading or confusing to other learners present -- even though the trainer/teacher understands perfectly well what the learner is trying to articulate. A clarification probe might ask the learner to rephrase his or her response, or to articulate a more succinct response. In essence, these probes ask, "What is it you are really trying to say?" They are particularly

helpful in guiding the learner to articulate his or her own response (assuming s/he has the knowledge to do so) rather than having someone else (the trainer/teacher?) provide the appropriate answer.

3. Justification Probes. Justification probes do just that -- they ask the learner to justify his or her response to a given question. They are quite helpful to the trainer/teacher regardless of whether or not the learner's initial response was correct or incorrect. If the response was correct, the probe provides additional information about why the learner chose that response and about his or her depth of knowledge (or how s/he thinks); if the response was incorrect, it will provide insight into the thinking process used by the learner in choosing a response.

4. Prompting Probes. In many instances, learners do not respond to questions simply because they are not able to put together all the pieces necessary to phrase a "right" answer or because they have not grasped the real intent of the question. Prompting probes give the learner additional clues as to the proper or desired response, which may allow him or her to sort more judiciously through the bits of information floating about in his or her mind and representing potential pieces of a response. Prompting probes can be likened to the real

prompter behind the scenes in stage plays -- ready to assist if the leading man suddenly forgets his lines before an audience of 300 people.

5. Redirection Probes. A redirection probe is one that is addressed to more than one learner; it is the same question, but by addressing that question to different learners, the trainer/teacher can find out what a number of learners are thinking and what different approaches or solutions might be proposed for a single problem. Redirection probes are not, as a rule, applicable as a follow-up to knowledge level questions that have definitive right or wrong answers.

Again, probing questions are an integral part of a successful overall questioning strategy in training and teaching. The fact that they cannot be planned does make it necessary for the trainer/teacher to be very attentive to the types of responses made by learners and to be able to follow through with the appropriate type of probing question. They are wonderful tools for increasing learner participation and decreasing the amount of "teacher talk" in a given situation.

The Dynamics of Questioning

Questioning is a curious mix of art and science. The science of questioning is knowing and using the "mechanics" of the appropriate level and probe for a specific purpose (recall of knowledge, application of knowledge, problem solving, etc.). The art of questioning is being able to employ this tool in a two-way communication process in an atmosphere that fosters learner-initiated questions, challenges to the trainer/teacher, guidance and acceptance -- not an atmosphere of tension, anxiety and game-playing on the part of either trainer/teacher or learners. Very few individuals emerged from their years of schooling without falling prey to an instructor who was universally held in dread because of his or her use of sarcasm and personal attack when the correct response to questions was not immediately forthcoming.

Successful questioning dynamics involves the actual phrasing of the question itselfion itself, delivering that question, using wait-time, listening to the response, and dealing with that response appropriately.

1. Phrasing the question. The most important thing to remember is simply to ask only one question per question, and to make that question very clear. Ambiguous or confusing questions are unfair to learners. Such questions either provide too many factors for the learner to consider at one time OR do not provide enough information for responding.

The most common phrase denoting an ambiguous or confusing question is likely to be "What about...?" (as in "What about cancer?"). Such a question simply gives the learner no criteria for an appropriate or desired response; s/he is literally free to open new vistas in a response. Such questions are likely to waste valuable learning time. Give thought to the phrasing of the question: use appropriate vocabulary levels, ask only one question, and state it very succinctly.

2. Delivering the question. Questions serve many purposes, among them to gain learner participation and to prompt thought processes. In order to fulfill this purpose with as many learners as possible, ask the question first and then either call on an individual or open the floor to volunteers. Saying first the name of the learner to respond and then asking the question alerts all other learners that they do not have to formulate an answer and respond -- at least for the moment. Ask the question first so that all learners will formulate a response in the event they are called upon or wish to volunteer a response.

3. Using wait-time. Trainers/teachers are often frustrated while using questioning simply because they do not allow enough time for learners to formulate responses -- even to difficult problem-solving level questions. "Wait-time" refers to the

amount of time that elapses between asking a question and then asking someone to respond to that question. A good rule of thumb to consider is to ask the question, alert the learners that they should take some time to think about their responses, wait at least five seconds (longer if necessary) before asking for volunteers or calling upon an individual learner.

4. Listening to learner responses. A very quick way for trainers and teachers to discourage learner participation in questioning is to give the impression that they are not listening to learner responses, for whatever reason. Some suggestions to indicate interest in learner responses include maintaining eye contact with whomever is responding and not interrupting until that learner has finished speaking. If a response then is judged to be unacceptable, probing questions can be utilized to guide the learner to a more acceptable response or some on-the-spot remediation can occur.

5. Dealing with inadequate responses. Regardless of how wrong, inappropriate or just plain silly a response seems to be, sarcasm or personal attack generally will not promote better thinking from the learners. What such trainer/teacher reactions does promote is learner defensiveness, embarrassment and resentment -- and a reluctance to participate from that point on. It is very difficult for an individual to learn

when s/he is angry, upset and/or embarrassed. While it is arguable that some learners do seem to thrive on such engagements with their trainers/teachers, the reaction of personal attack or sarcasm cannot be recommended for successful questioning strategies. The most effective route to improving learner responses is to use reinforcement for any portion of the response that is appropriate, and to use probing questions or other strategies to "correct" what was not appropriate.

CONCLUSION

Truly effective questioning strategies are a result of attention to both the mechanics and dynamics involved. The mechanics include planning specific questions at the knowledge, application and problem solving levels in order to foster different (and progressively higher) levels of learner thinking. The five types of probing questions -- extension, clarification, justification, prompting and redirection -- can then be used during questioning to help guide responses that are forthcoming to the planned questions. The dynamics involved include phrasing a concise question; delivering that question appropriately; using wait-time; listening to the learner's response; and dealing with that response appropriately.

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